MGT Power Supply handbook

MP MASTER
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GOULD

The Gould MGT family of power supplies is a range of very compact units employing direct-off-line switching techniques in order to reduce physical dimensions to a minimum.
The range consists of two units, both producing the same three independent output voltages of 5V, 12 or 15V, 12 or 15V.
The output voltages are adjustable by ± 5% or ±0·5V by means of screwdriver adjustments on the front panel. Facilities are provided for local or remote sensing and for a limited amount of voltage programming by means of an externally connected resistor.
Constant current protection is provided against overloads or short circuits on all outputs together with auto-resetting thermostatic protection against prolonged short circuits on the 12 or 15V outputs.
Overvoltage protection by means of automatic control circuit shut-down is provided on all units.
Particular attention has been paid during the design stage to the problems of interference caused by the switching action of the power supply circuits. In this respect sample units have met the requirements of VDEO875, Curve 'N', and BS800 Part 3.
The MGT5-20B is fitted with a soft-start facility to reduce input current surges at switch-on.

Specification

Input

	MGT5-20A	MGT5-20B
Voltage	120V + 10%	240V + 10%
	115V – 20%	220V – 20%

See characteristic curves for limitations.

Frequency	45-440Hz	
Current (typical)	3·2A rms	1·75A rms
	1·66A mean	0·8A mean
	8·5A rep. peak	6A rep. peak

Outputs

Main output 5V, 20A. Voltage adjustable ± 5% by front panel potentiometer.
Auxiliary output 1. 12V or 15V (set by internal taps), 1·75A. Voltage adjustable ± 0·5V by front panel potentiometer. Factory set at 15V.
Auxiliary output 2. Identical to Auxiliary Output 1.

Output Voltage Regulation

Main output 0·1% maximum for worst case combination of 0-100% load change on all outputs and ± 10% line change.
Auxiliary outputs ·01% maximum for worst case combination of 0-100% load change on all outputs and ± 10% line change.

Ripple

Main output 10mV r.m.s., 50mV peak-peak (30MHz Bandwidth)
Auxiliary outputs 3mV r.m.s., 20mV peak-peak (30MHz Bandwidth)

Temperature Coefficient

All outputs less than ± 0·01%/°C.

Output Impedance

Main output 100mΩ @ 100KHz
Auxiliary outputs 250mΩ @ 100KHz

Overload Protection

Constant current on all three outputs, set to 110% ± 5% of full load.
Auto-Reset thermostat shuts down all outputs if a prolonged short circuit occurs on an auxiliary output which gives rise to excessive heatsink temperatures.

Overvoltage Protection

All outputs shut down if voltage of main output exceeds 120%-130%. No protection of auxiliary outputs.

Temperature Range

– 10°C to +70°C derating on all outputs from 50°C at 2½%/°C.

Series and Parallel Operation

Main outputs cannot be connected in parallel. Auxiliary outputs can be connected in parallel without limit. The main output can be connected in series with the outputs of units with a similar current rating (such as other MGT5-20B or MG5-20B units) up to a maximum of 250V.
Auxiliary outputs can be connected in series with each other or similar units up to a maximum of 250V.

Remote Sensing

Available on front panel for all outputs. Voltage drop should not exceed 0·5V total. See output characteristic curves for limitation on the main output.

Remote Programming

On main output only with limit on range of 4·75V up.

and – ve power line, the waveform of Fig. 1 should be observed.

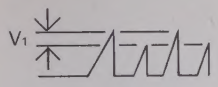


Fig. 1

Increase the sensitivity of the oscilloscope to 2V/cm, and display the peaks of the waveform. Adjust the R46 decade box to minimise the voltage difference between alternate peaks, i.e., reduce V1. This adjustment should be done with the scope timebase desynchronized.

2. Connect oscilloscope between Pin 3 and – ve power line. The waveform of Fig. 2 should be observed.

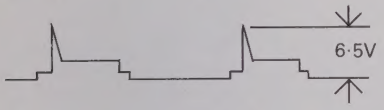


Fig. 2

3. Connect oscilloscope between Pin 4 and – ve power line, and check that the same waveform is observed.
   Apply 1mA constant current between Pins 12 and 13 and select R37 to cause the trailing edge of the pulse to start closing in towards the leading edge. Remove the 1mA source.
4. Apply 12·4mA constant current between Pins 19 and 20, the observed waveform should change to that shown in Fig. 3.

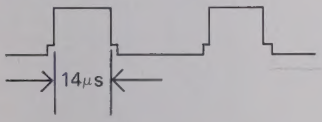
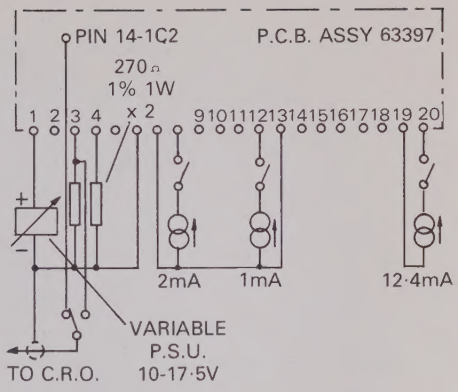


Fig. 3

Select R34 to reduce pulse width to 7·5μS ± ·2μS. Remove the 12·4mA source.

5. Apply 2mA constant current between Pins 7 and 8, the waveform should now revert to that of Fig. 2.
   Select R45 for the lowest value that causes the waveform to collapse. Remove the 2mA source.
6. Vary the power supply to 10V and then to 17·5V. Check that there is no degradation of waveform.
7. Reduce power supply to 7V. Check that oscillation ceases.



P.C.B. TEST CIRCUIT

Guarantee and service facilities

This instrument is guaranteed for a period of five years from its delivery to the purchaser covering the replacement of defective parts other than fuses.
We maintain comprehensive after sales facilities and the instrument can, if necessary, be returned to our factory for servicing. The Type and Serial Number of the instrument should always be quoted, together with full details of any fault and the service required. The Service Department can also provide maintenance and repair information by telephone or letter.
Equipment returned to us for servicing must be adequately packed preferably in the special box supplied, and shipped with the transportation charges prepaid. We can accept no responsibility for instruments arriving damaged. Should the cause of failure during the guarantee period be due to misuse or abuse of the instrument, or if the guarantee has expired, the repair will be assumed authorized and charged unless other instructions are received.
OUR SALES, SERVICE AND ENGINEERING DEPARTMENTS ARE READY TO ASSIST YOU AT ALL TIMES.

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